Find each function given $f(x) = x^2 - 3$ and $g(x) = 2x - 5$.

1) f - g

$(x^2 - 3) - (2x - 5)$

$x^2 - 3 - 2x + 5$

$x^2 - 2x + 2$

2) fg

$(x^2 - 3)(2x - 5)$

$2x^3 - 5x^2 - 6x + 15$

3) f(g(x))

$f(2x - 5)$

$(2x - 5)^2 - 3$

$(2x - 5)(2x - 5) - 3$

$4x^2 - 10x - 10x + 25 - 3$

$4x^2 - 20x + 22$

Define the variables, then write a system of two equations with two unknowns and solve for the requested information.

1) A number is 12 less than a third of another number. Their sum is 56. What are the two numbers?

$a = \frac{1}{3}b - 12$ $\quad a + b = 56$

$a = \frac{1}{3}(51) - 12$ $\quad 3\left[\left(\frac{1}{3}b - 12\right) + b = 56\right]$

$a = 17 - 12 = 5$ $\quad b - 36 + 3b = 168$

$4b = 204$

$a = 5$

$b = 51$

2) Jimmy has a pocketful of quarters and dimes. He has 13 coins which have a total value of $2.50. How many of each coin does he have?

$25q + 10d = 250$

$q + d = 13$

$-10q - 10d = -130$

$15q = 120$

$q = 8$

$8 + d = 13$

$d = 5$

8 quarters

5 dimes

3) There are 3 more dimes than nickels in a sack of coins. The value of the coins is $8.85. How many nickels are there?

60 dimes, 57 nickels

$d = n + 3$

$10d + 5n = 885$

$10(n + 3) + 5n = 885$

$10n + 30 + 5n = 885$

$15n = 855$

$n = 57$

4) Two angles are supplementary. The measure of one angle is ten more than three times the other. Find the measure of each angle.

$x + y = 180$

$x = 3y + 10$

$(3y + 10) + y = 180$

$4y + 10 = 180$

$4y = 170$

$y = 42.5$

$x = 3(42.5) + 10 = 137.5$

42.5° and 137.5°

5) Rita is older than Megan. The difference in their ages is twelve and the sum of their ages is fifty. How old is Rita?

$R + M = 50$

$+ \; R - M = 12$

$2R = 62$

$R = 31$

$31 + M = 50$

$-31 \quad -31$

$M = 19$

Rita is 31 years old

Megan is 19 years old

3.3 Linear Inequalities in Two Variables

Algebra 2 5.0

Name_____

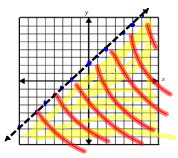
Date_____ Pd_____

☺The solution of a linear inequality is an ordered pair (x, y) that satisfies the inequality.

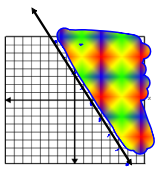
☺The solution to a linear inequality is a region of the coordinate plane and is called a *half-plane* bounded by a *boundary line*.

Graph each linear inequality.

1) $y < x + 2$



2) $y \geq -2x + 3$



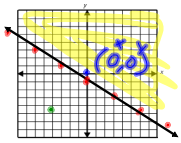
3) $-2x-3y \le 3$

$-3y \le 2x+3$

$y \ge -\frac{2}{3}x-1$

$0 \ge -\frac{2}{3}(0)-1$

$0 \ge -1$ ✓



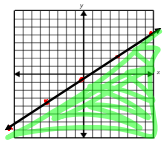
0 - 0 ≥ 4

4) $3x-4y \ge 4$

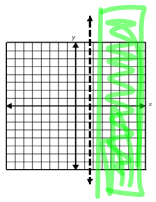
$-3x \quad -3x$

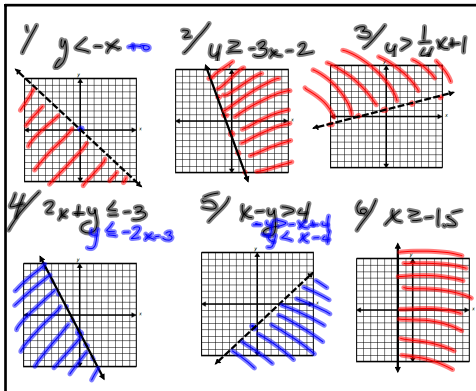
$-4y \ge -3x+4$

$y \le \frac{3}{4}x-1$



5) $x > 2$





3.4 Systems of Inequalities Name_____

Algebra 2 5.0 Date_____Pd____

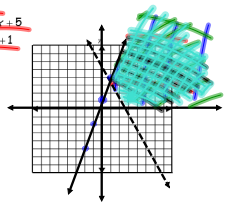
☺A **system of linear inequalities** is a collection of linear inequalities in the same variables.

☺The solution is an ordered pair that satisfies each of the inequalities in the system.

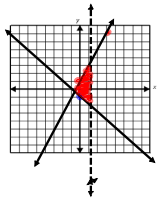
Example 1: Graph the system.

$\begin{cases} x \ge 0 \\ y \ge 0 \\ y > -2x+5 \\ y \le 3x+1 \end{cases}$

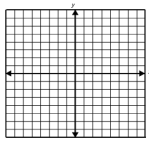
(3,3)



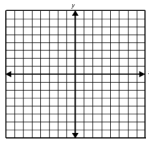
1) $\begin{cases} y \ge -x-1 \\ y \le 2x+1 \\ x < 1 \end{cases}$



2) $\begin{cases} y > -x-2 \\ y > x+3 \\ y \le 3 \end{cases}$



3) $\begin{cases} x \ge 0 \\ y \ge 0 \\ y \ge -x+4 \\ y > x \end{cases}$



4) $\begin{cases} y \ge x \\ y \ge -x+1 \\ y < 2 \end{cases}$